

Chapter 2 -- GROUNDWATER COORDINATION

The Groundwater Coordinating Council (GCC) is directed by s. 160.50, Wis. Stats., to "advise and assist state agencies in the coordination of non-regulatory programs and the exchange of information related to groundwater, including, but not limited to, agency budgets for groundwater programs, groundwater monitoring, data management, public information and education, laboratory analysis and facilities, research activities and the appropriation and allocation of state funds for research." To assist in this work, the GCC is authorized to create subcommittees on "the subjects within the scope of its general duties...and other subjects deemed appropriate by the Council." Additionally, the GCC is directed to "advise the Secretary of Administration on the allocation of funds appropriated to the Board of Regents of the University of Wisconsin under s. 20.285(1)(a) for groundwater research."

The purpose of this chapter is to describe the activities of the Council and its Subcommittees during FY 06, as well as the coordination of the Wisconsin Groundwater Research and Monitoring Program. Through these activities, the GCC continues to play an important role in ensuring agency coordination, increasing efficiency and facilitating the effective functioning of state agencies in activities related to groundwater protection and management. Ultimately groundwater is better protected, which protects public health and preserves Wisconsin's natural resources for future generations.

GROUNDWATER COORDINATING COUNCIL

The GCC consists of the heads of all state agencies with some responsibility for groundwater management plus a Governor's representative. The agency heads have appointed high-level administrators with groundwater responsibilities to sit on the Council. The state agencies include the DNR, Commerce, DHFS, DATCP, DOT, WGNHS, and the UW System. The GCC has created four subcommittees to assist in its work. The subcommittees are composed of approximately 60 people including members of the GCC, employees of state and federal agencies, university researchers and educators, representatives of counties and municipalities and public members. Through FY 05, the DNR has had one permanent position with half of its responsibilities related to coordination of the GCC. In FY 06, due to budget cutbacks there was less GCC support than in previous years.

The GCC took an active role in many groundwater issues and activities during FY 06, several of which are highlighted and summarized here.

Addressing Long-Term Groundwater Management Needs

In October 2001, the GCC facilitated an event called "Wisconsin's Groundwater Summit." The Summit brought together a broad spectrum of groundwater users and stakeholders to discuss issues facing groundwater protection and management and develop solutions to better protect Wisconsin's groundwater. Representatives from over 50 organizations attended the meeting. These included environmental, conservation, and agricultural groups, industrial users, water utilities, local and tribal government, planning agencies, state and federal agencies, and university researchers and educators. Findings and recommendations from the Summit are contained in the document *Sharing Our Buried Treasure: A Summary of the 2001 Groundwater Summit* available at <http://dnr.wi.gov/org/water/dwg/gcc/SOBT.pdf>.

Summit participants identified 9 "Key Themes" to guide groundwater management activities over the next decade:

- 1) Clarifying "Whose Water is it?"
- 2) Recognizing the Connections Between Groundwater and Surface Water
- 3) Evaluating and Managing Threats to Groundwater Quality
- 4) Linking Land Use Planning and Groundwater Protection
- 5) Developing a Comprehensive Approach to Groundwater Quantity
- 6) Addressing Water Use and Conservation Issues
- 7) Exploring Options for Regionalization of Water Management
- 8) Building a Groundwater Constituency through Public Education and Involvement
- 9) Collecting Long-Term Groundwater Data to Address Long-term Problems

During the past year, the GCC and its Subcommittees continued to address strategies suggested by these Key Themes. The Education Subcommittee continued to make linkages to a broader base of people involved in groundwater education (*Key Theme 8*). Members of the Monitoring and Data Management Subcommittee began implementing a long term groundwater monitoring strategy (*Key Theme 9*). Several research priorities identified at the Summit were incorporated into agency research and monitoring priorities that yielded projects funded for FY07 (*Key Themes 2, 3 and 9*).

There have been a number of collaborative efforts to promote groundwater protection in the comprehensive planning process by local governments (*Key Theme 4*). In 2002, representatives from three GCC Subcommittees prepared and distributed three Comprehensive Planning and Groundwater Fact Sheets to promote inclusion of groundwater information in comprehensive plans. The fact sheets were reviewed and updated in 2005. Through the Wisconsin groundwater research and monitoring program, two projects have been funded to address how to make groundwater information available to local governments for use in comprehensive plans.

The historic groundwater quantity law signed by Governor Doyle on Earth Day 2004 (see *Introduction* and groundwater quantity discussion in *Condition of the Resource* chapter) addressed several key themes of the Groundwater Summit. The law recognizes that groundwater quantity issues need a more comprehensive approach (*Key Theme 5*). For the first time, impacts of groundwater withdrawals on surface waters were acknowledged in statutory language (*Key Theme 2*). Provisions requiring reporting of water use for high capacity wells (*Key Theme 6*) and the creation of Groundwater Management Areas (*Key Theme 7*) also reflect a more comprehensive approach.

The GCC was an active participant in the process that led to the creation of the groundwater quantity law through the creation of a Quantity Subcommittee and discussions at its quarterly meetings. Many subcommittee members and agency representatives contributed data, research findings, maps, modeling scenarios, and technical expertise to help answer questions and ensure that the legislation was based on sound scientific principles. The GCC has continued to play a role in the implementation of the legislation, through its research and monitoring oversight, as well as making technical information and expertise available to the Department of Natural Resources and the Groundwater Advisory Committee created by the legislation.

Implementing a Statewide Groundwater Monitoring Strategy

In FY 06 initial stages of the statewide groundwater monitoring strategy were implemented with the help of representatives from the DNR, DATCP, USGS, WGNHS, and UW Stevens Point. The

objective of the new monitoring strategy is to coordinate groundwater monitoring between all state agencies that regulate groundwater to assess groundwater quality and quantity in the state.

Over the next ten years, components of the strategy will be integrated into DNR's overall water monitoring plan. Other agencies will also continue to make improvements in their monitoring efforts based on the comprehensive strategy. The components of the strategy may change over time according to needs of the different agencies.

Information and Outreach Activities

Groundwater: Wisconsin's Buried Treasure and the *Groundwater Study Guide*, both very popular DNR publications, were revised, printed and distributed in FY 06. Other informational or educational publications that were recently updated to include new information were *Arsenic in Drinking Water*, *Nitrate in Drinking Water*, *Iron Bacteria Problems in Wells*, and *Karst: Avoid that Sinking Feeling*.

For the sixth year in a row, three groundwater workshops for teachers were taught jointly by staff from the DNR, WGNHS and the Center for Watershed Science and Education (CWSE) at UW Stevens Point. The workshop leaders instructed teachers on using a groundwater sand tank model and provided additional resources to incorporate groundwater concepts into their classroom. Teachers from 21 different schools attended the workshops and received a free model for their school. With funding from an EPA grant, 141 groundwater models have been given to schools since 2001.

Drinking Water Education programs continue to offer communities across Wisconsin the opportunity to have private wells tested and attend a program to learn more about their community's groundwater quality. In 2005, nearly 2,000 private well owners in 11 different counties took part in this educational opportunity.

This year, the fourth annual Groundwater Festival was held in Manitowoc on April 27, 2006. The event was organized by staff at CWSE, Groundwater Guardians, and local land conservation departments. Volunteers from many state agencies, local colleges and high schools helped lead hands-on groundwater activities to over 600 5th and 6th graders from Brown, Calumet, Kewaunee, Manitowoc and Door counties.

Attendants of this year's Farm Technology Days had an opportunity to have their private well water tested for nitrate and receive additional information regarding drinking water and groundwater quality. Over 200 individuals had water tested and hundreds more stopped by to have their questions answered by CWSE staff.

Coordination of Groundwater Research and Monitoring Program

The GCC, the UW System, and the Groundwater Research Advisory Council (GRAC) continued coordination of the annual solicitation for groundwater research and monitoring proposals among state agencies, as specified in a November 2002 Memorandum of Understanding (MOU). (Details are found in the section on *Wisconsin's Groundwater Research and Monitoring Program*). The GCC approved the FY 06 Solicitation for Proposals in August of 2004 (see *Appendix D*). In January 2005, members of 2 GCC Subcommittees reviewed the proposals that were submitted and made their recommendations to the agencies and GRAC. The GCC unanimously approved the proposed UWS groundwater research plan as required by s. 160.50(1m), Wis. Stats., at its February meeting and a letter was sent to the UW System president and the Department of

Administration to this effect.

Through these coordination activities, the GCC helps create efficiencies in the proposal submittal process and help ensure that taxpayer dollars are directed at the most pressing needs for groundwater information.

Other Coordination Activities

The GCC continued to promote communication, coordination and cooperation between the state agencies through its quarterly meetings. The meeting minutes are included in Appendix B. In addition to the activities listed above, the GCC received briefings and heard presentations on:

- Subcommittee activities (see below)
- 2006 GCC Report to the Legislature
- UWS FY 07 groundwater research plan, including optimization of Water Research Center funding
- FY 07 joint solicitation for groundwater proposals
- Annex 2001 update
- Springs research progress report
- Groundwater Advisory Committee progress
- Using Groundwater Models to Assess Flow to Wells in Residential Subdivisions
- Manure Management Task Force Recommendations and Implementation Strategy
- Groundwater Modeling Effort for Village of Eagle
- Agency updates

SUBCOMMITTEE SUMMARIES

The GCC is directed to "serve as a means of increasing the efficiency and facilitating the effective functioning of state agencies in activities related to groundwater management." The Subcommittees of the GCC carry out this charge by regularly bringing together staff from over 15 different agencies, institutions and organizations to communicate and work together on a variety of research, monitoring and data management, planning and mapping, educational and local government issues.

In FY 05, the GCC approved a reorganization of the GCC Subcommittees to more effectively meet current needs. The functions and members of the Planning and Mapping Subcommittee were merged with the Local Government Subcommittee and Monitoring and Data Management Subcommittee. The Planning and Mapping Subcommittee no longer exists. In addition, the Monitoring and Data Management Subcommittee was maintained as one Subcommittee, but the tasks will be divided between two workgroups. With the enactment of the groundwater quantity legislation, the need for the Groundwater Quantity Subcommittee no longer exists so it has been dissolved. See further details on the Subcommittee restructuring below.

In addition, numerous contacts and informal conversations are generated both at meetings and through email communications among Subcommittee members, leading to better communication across agency lines on a variety of issues. These activities are related to participation of agency staff on GCC Subcommittees and create efficiencies and provide intangible benefits to Wisconsin's taxpayers.

Research Subcommittee

The purpose of the Research Subcommittee is to assist the GCC in establishing priorities for groundwater research and monitoring activities and to review proposals submitted through the Wisconsin Groundwater Research and Monitoring Program. The subcommittee met with the Monitoring and Data Management Subcommittee in January 2006 to review proposals that were submitted in response to the FY 07 solicitation. Subcommittee members made recommendations that were used by the UWS in deciding which groundwater-related proposals to fund for FY 07. The projects to be funded in FY 07 are listed in Table 2.

To address the need for more dissemination of research and monitoring findings, and to ensure that future proposals address pressing state needs, the subcommittee chose to address groundwater research and monitoring needs related to manure management at a special topic meeting to be held in early FY 07. This meeting and other similar future meetings will help efficiently focus limited research and monitoring funds on high priority project areas, maximizing use of state dollars.

Monitoring & Data Management Subcommittee

The goal of the Monitoring & Data Management Subcommittee (MDMS) is to coordinate groundwater monitoring and data management activities of state agencies to maximize value and efficiency. Subcommittee members continued to work collectively, individually, and in small groups on GCC activities or action items targeted by the subcommittee. Several key issues were addressed in FY 06. The Groundwater Monitoring strategy drafted in 2004 was further revised and incorporated into the DNR's Water Division strategy. Several subcommittee members were involved in helping the DNR's Groundwater Section draft a "Condition of the Resource Report" on nitrate.

Subcommittee members evaluated and discussed the 12 proposals received in this year's solicitation at their annual meeting with the Research Subcommittee. Subcommittee members made recommendations that were used by the UWS in deciding which groundwater-related proposals to fund for FY 07.

The subcommittee continued to be a forum for information exchange to prevent duplication of efforts and increase the utility of monitoring data. In FY 06 the MDMS met regularly to update one another on their agencies' activities. This year's topics included: DNR implementation of groundwater quantity legislation; a WGNHS water use study; changes to DNR UW, and DATCP groundwater monitoring databases; and new digital products from WGNHS.

Education Subcommittee

The Education Subcommittee's mission is to review public information and education materials, coordinate educational messages among agencies, and serve as a forum to identify groundwater education needs, ideas and concerns in Wisconsin. At each meeting, representatives share information about current agency activities related to groundwater and discuss current and future ideas for informational needs and educational activities.

The subcommittee met a total of four times during FY 06. During that time, the members of the subcommittee were involved in a number of collaborative efforts related to groundwater education; some of which are included in the Information and Outreach Activities section of this

report. Members also provided inputs into revisions of popular groundwater publications such as the *Groundwater Study Guide* and *Groundwater: Wisconsin's Buried Treasure* publications. The Subcommittee commented on a proposed arsenic well test result website to provide information to homeowners on results of private well testing for arsenic. Representatives from some of the organizations on the Groundwater Information Network were brought in to discuss relevant groundwater education work that they are involved in.

During the next year the subcommittee will continue to identify and respond to educational needs on emerging groundwater issues in the state.

Local Government and Planning Subcommittee

The Local Government Subcommittee was formed in 1993 to promote communication between local governments and the state government regarding groundwater issues. At its February 2004 meeting, the GCC combined the Local Government Subcommittee with the planning function of the former Planning and Mapping Subcommittee to create the Local Government and Planning Subcommittee (LGPS). Both Subcommittees have been addressing planning issues for some time, so it made sense to combine these two subcommittees.

The LGPS met April 25, 2006 in Madison. The Subcommittee heard an update on the effort by the UW Stevens Point Center for Land Use Education (CLUE) and the U. S. Geological Survey to develop a website for groundwater information for use in comprehensive plans and provided input on a questionnaire to be sent out by CLUE. The Subcommittee also got a status report on implementation of the 2004 groundwater quantity law and learned about Annex 2001 to the Great Lakes Charter and its implications for Wisconsin. The Subcommittee discussed including more local government representation and addressing issues of interest to local governments that might lead to recommendations to the GCC. The LGPS will continue to follow the comprehensive planning and groundwater quantity law implementation initiatives.

WISCONSIN'S GROUNDWATER RESEARCH AND MONITORING PROGRAM

The GCC provides consistency and coordination among state agencies in funding groundwater monitoring and research to meet state agency needs. Approximately \$13.3 million has been spent through FY 06 on 336 different projects dealing with groundwater or related topics (see *Appendix C* for a complete listing). The four programs, collectively called the Wisconsin Groundwater Research and Monitoring Program, have different sources of money and purposes, which are summarized as follows: include:

1. DNR Management Practice Monitoring – Except for FY 05, the DNR has had at least \$125,000 available each year since FY 86 to support groundwater monitoring studies evaluating existing design and/or management practices associated with potential sources of groundwater contamination. The intent of these studies is to identify appropriate management practices to reduce the impacts of potential sources of contamination. The money comes from the Groundwater Account of the Environmental Fund (which is funded by various fees). Additional funds have been available in some years through various Federal and State sources, enabling the DNR to fund additional projects. Through FY 06, the DNR has spent approximately \$6 million on 182 monitoring projects. Several of these projects have been co-funded with DATCP, Commerce and/or UWS.
2. UWS Groundwater Research - The UWS, through its UW-Madison Water Resources Institute (WRI), has received funding since FY 90 for groundwater research. Projects

may be of a fundamental or applied nature on any aspect of groundwater research in the natural sciences, engineering, social sciences or law. Through FY 06, the UWS has spent \$5 million on 138 groundwater research projects. Several projects have been co-funded with DNR, Commerce and/or DATCP and eleven were co-funded with WRI through the US Geological Survey.

3. DATCP Pesticide Research - Since 1989, DATCP has had up to \$135,000 available annually to fund research on pesticide issues of regulatory importance. The money comes from fees paid by pesticide manufacturers to sell their products in Wisconsin. Starting in FY 03, these funds have not been available for new research. Through FY 06, DATCP has spent about \$1.8 million on 42 pesticide projects. Several of these projects have been co-funded with DNR and/or UWS.
4. Department of Commerce Private Onsite Wastewater Treatment System (POWTS) Research - Due to budget shortfalls, Commerce has not been able to fund research projects since FY02. Through FY 06, DILHR/Commerce has spent approximately \$600,000 on eight projects. Two projects were co-funded with DNR and UWS.

Solicitation and Selection of Proposals

The UWS, DNR, DATCP, and Commerce annually participate in a joint solicitation for research and monitoring proposals dealing with groundwater, pesticides and/or onsite wastewater treatment systems.

In 1988, the GCC requested that the UWS create a Groundwater Research Advisory Council (GRAC) to establish a long-range groundwater research plan and develop a groundwater research decision item narrative (DIN) for inclusion in the University's biennial budget. The GRAC consists of university, state agency, and public representatives. During the summer of 1990, the GRAC and GCC developed and endorsed a plan to coordinate the solicitation of projects for funding in FY 92 and subsequent years. The joint solicitation provides for only one submittal of project proposals, rather than four as had been the case. The intent of the joint solicitation is to determine the most appropriate funding source for a particular project.

Statutory language requires that there be agreement between the UWS and the GCC on the use of the UWS research funds before the funds can be released by the Department of Administration (s. 160.50(1m), Wis. Stats). To expedite this agreement, a Memorandum of Understanding (MOU) was signed in 1989 and 1991 by representatives of the GCC, the GRAC, and the UWS on use of the UWS groundwater research funds. This MOU was reviewed and updated in November 2002. The MOU spells out the procedures for establishing priorities and selection of projects for funding of UW groundwater research. The MOU recognizes that the GCC has a substantive role in establishing research priorities and an advisory role in project selection to minimize overlap and duplication.

FY 06 Proposal Solicitation. The Solicitation for Proposals (SFP) for FY 06 was distributed in September 2004. A total of 29 project proposals were submitted in response to the SFP. To assist in the review process, a joint meeting of the Monitoring & Data Management and Research Subcommittees of the GCC was held in January 2005 to review and rank the projects that were submitted for funding. As a result of the subcommittee meeting, the GRAC meeting in March, and review of the proposals by agency staff, 16 new projects were selected for funding in FY 06, by the DNR and UWS. Four on-going projects were carried over into FY 06. A total of 20 projects were funded through the joint solicitation at a cost of approximately \$525,956 (see Table

1).

FY 07 Proposal Solicitation. The SFP was distributed in September 2005 for funding in FY 07. The SFP package (see *Appendix D*) contained a listing of the monitoring and research priorities for each of the agencies, as determined by agency staff, the GRAC, and members of the GCC Monitoring & Data Management and Research Subcommittees. The deadline for proposals was November 14, 2005.

The entire submission and review process was conducted online through a secure web site administered by the WRI. Investigators could upload and modify contact information, proposal narratives, and budget information at any time up to the deadline. Reviewers were able to simply log on to the site to review proposals at their convenience. A total of 12 proposals were submitted, requesting a total of \$643,311 in funding. A minimum of 3 external peer reviews was solicited for each proposal from experts within the field. GCC Subcommittee members and agency staff also reviewed the proposals and met in January to rank the proposals. In addition, the GRAC met in February to select projects to recommend to the GCC for UWS funding.

A total of eight new projects were selected for funding; five by DNR and three by UWS. Including projects continued from FY 06, the DNR will fund 11 projects and the UWS will fund eight projects in FY 07 at a total cost of \$574,122. DATCP and Commerce will not be funding new projects in FY 07. With the assistance of Federal (USGS) dollars leveraged through the Water Resources Institute, all of the continuing UWS projects that began in FY 05 will be funded through FY 07. The projects to be funded in FY 07 are listed in Table 2.

State budget shortfalls have limited the number of new projects that were selected for funding during recent years. Commerce has been unable to fund new projects since 2001, DATCP since 2003. The UWS budget was cut by 10% in FY 04 and again in FY 05. DNR's state groundwater funding for projects has been cut significantly since FY 02 (see Table 3) but has recovered somewhat because of the addition of Federal Wellhead Protection and State Act 310 Groundwater Quantity funds to State Groundwater Management Practice Monitoring funds.

Continued cuts will hamper the State's ability to address critical groundwater monitoring and research needs in the future. Research and monitoring can be extremely cost-effective in that once a problem is established in the subsurface it is much more time, labor, and cost intensive to remediate than to use prevention strategies. Without adequate funding for research and monitoring we don't know what the best prevention strategies are. The GCC will continue to encourage its member agencies to maintain adequate resources for groundwater monitoring and research and to seek partnerships to leverage additional funds.

Coordination with Other Research Programs

The GCC attempts to compile information about other groundwater research programs within Wisconsin. For example, many groundwater-related research projects are funded through the Wisconsin Fertilizer Research Council (<http://www.soils.wisc.edu/frc/>). Staff from the GCC also work with the Research Committee of the Wisconsin Water Association (WWA), the state affiliate of the American Water Works Association (AWWA).

Also, the GCC is actively involved in efforts to use state funded research projects to leverage Federal funds, through the USGS, EPA, and the Centers for Disease Control (CDC). Proposals submitted to Wisconsin's Groundwater Research and Monitoring Program are occasionally forwarded to these federal partners, or re-worked to meet the specific needs of the funding source.

Distributing Project Results

Final reports are required for each project funded through Wisconsin's Groundwater Research and Monitoring Program. Reports from UWS funded projects are kept in the Water Resources Library. DATCP, Commerce, and DNR funded reports are kept on file with the respective agencies, but many are provided to the Water Resources Library for public distribution as well. All project investigators must submit a 2-page Project Summary upon completion of the final report. These summaries are made available on the WRI web site (<http://www.wri.wisc.edu/wgrmp/wgrmp.htm>). Over 130 summaries are currently provided. Summaries from older reports are printed in *Wisconsin Groundwater Research and Monitoring Project Summaries* (DNR PUBL-WR-423-95 and DNR PUBL-WR-205-90) both of which are available from the Water Resources Library or the DNR.

Previously, only summaries of the funded projects were available online. During the past year, the Water Resources Library partnered with UW Libraries' Digital Collections Center to digitize and put online most WRI and selected DNR final project reports. The WRI Groundwater Research and Monitoring Program Web site now links to the full-text reports, which are included in the University of Wisconsin Ecology and Natural Resources Digital Collection at <http://digital.library.wisc.edu/1711.dl/EcoNatRes.Groundwater>. Inclusion in the UW Ecology and Natural Resources online collection should make a wider audience aware of this important groundwater research.

Projects funded through Wisconsin's Groundwater Research and Monitoring Program have provided valuable information regarding the Wisconsin's groundwater resources, helped evaluate existing regulatory programs, increased the knowledge of the movement of contaminants in the subsurface, and developed new methods for groundwater evaluation and protection. Chapter 6, *Benefits from Monitoring and Research Projects*, highlights some of these projects and illustrates how agencies have used the project results to improve the management of the state's groundwater resources.

Table 1: Groundwater Research and Monitoring Projects Funded in FY 06

<i>Agency</i>	<i>Title</i>	<i>Author(s)</i>	<i>Affiliation</i>	<i>FY 06 Budget</i>
DNR	Mechanisms of Groundwater Flow across Aquitards	David Hart, Kenneth Bradbury, Daniel Feinstein and Basil Yikoff	WGNHS, USGS & UW-Madison	\$37,615
	Centralizing Access to Groundwater Information for Use in Comprehensive Planning	Lynn Markham, Chin-Chun Tang and Charles Dunning	UW-Stevens Point & USGS	\$22,884
	A Survey of Baseflow for Groundwater Protection Areas Western Fox-Wolf Watershed	G. Kraft	UW-Stevens Point	\$35,438
	Groundwater Mounding and Contaminant Transport Beneath Stormwater Infiltration Basins	Anita Thompson	UW-Madison	\$34,840
	Mapping and Characterization of Springs in Brown and Calumet Counties	Kevin Fermanich Ron Stieglitz and Michael Zorn	UW-Green Bay	\$13,800

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Identification and characterization of springs in west-central Wisconsin	Katherine Grote	UW-Eau Claire	\$21,686
Evaluating drinking-well vulnerability to viruses	Randall Hunt and Mark Borchardt	USGS, Marshfield Clinic	\$36,485
Disinfection of Enteric Viruses in Wisconsin Municipal Groundwater Systems	Gregory Harrington, Mark Borchardt and Irene Xagorarakis	UW-Madison, Marshfield Clinic	\$31,615
+Assessing the Ecological Status and Vulnerability of Springs in Wisconsin	David Zaber, Susan Swanson, Kenneth Bradbury & Dave Hart	UW-Extension, Beloit College	\$12,000

The total cost for all projects funded by DNR through the FY 06 solicitation for proposals was \$246,363. There were no continuing projects to be funded by the DNR in FY 06.

<i>Agency Title</i>	<i>Author(s)</i>	<i>Affiliation</i>	<i>FY 06 Budget</i>
<i>UWS</i>			
*Mercury Speciation along a Groundwater Flowpath	D. Armstrong and C. Babiarz	UW-Madison	\$25,595
*Occurrence of Estrogenic Endocrine Disruptors in Groundwater	W. Sonzogni, J. Hemming, M. Barman and S. Geis	WSLH	\$0#
*Monitoring Environmental Effects at an Established Phytoremediation Site	W. DeVita and M. Dawson	UW-Stevens Point	\$17,890
*Foundry Slag for Treating Arsenic in Ground Water and Drinking Water	C. Benson and D. Blowes	UW-Madison	\$0#
Transient Functioning of a Groundwater Wetland Complex, Allequash Basin, Wisconsin	M. Anderson	UW-Madison	\$23,633
Measuring and Modeling Macroporous Soil Water And Solute Flux Below the Root Zone of a Plano Silt-Loam Soil	B. Lowery, J. Norman & B. Lepore	UW-Madison	\$31,121
Evaluation of On-site Wastewater Treatment as a Source of Antibiotic Resistance Genes in Groundwater	K. McMahon	UW-Madison	\$39,190
Arsenic Species (III,V) Distribution in Wisconsin's Groundwaters: Field Measurements and Prediction Using Multivariate Analysis of Geochemical Data	M. Shafer, K. Ellickson and J. Schauer	UW-Madison	\$28,026
Validation of Transport of VOCs from Composite Liners	T. Edil & C. Benson	UW-Madison	\$25,821
Nitrate and Pesticide Penetration into a Northern Mississippi Valley Loess Hills Aquifer	G. Kraft and B. Browne	UW-Stevens Point	\$30,562
Climate Signals in Groundwater and Surface Water System: Spectral Analysis of Hydrologic Processes	H. Bravo	UW-Milwaukee	\$33,717
+Assessing the Ecological Status and Vulnerability of Springs in Wisconsin	David Zaber, Susan Swanson, Kenneth Bradbury, Dave Hart	UW-Extension, Beloit College	\$24,038

The total cost for all new projects funded by the UWS in 06 was \$236,108. The total cost for all projects funded by the UWS in FY 06 is \$279,593 (including fringe benefits and 6% administration costs and excluding USGS co-funding).

funded by USGS base funding of WRI

+ denotes joint funding between the DNR and UWS

* denotes continuing project from FY 05

Table 2: Groundwater Research and Monitoring Projects to be funded in FY 07

<i>Agency</i>	<i>Title</i>	<i>Author(s)</i>	<i>Affiliation</i>	<i>Cost</i>
<i>DNR</i>	* Mapping and Characterization of Springs in Brown and Calumet Counties (extension from FY 06)	Kevin Fermanich, Ron Stieglitz and Michael Zorn	UW-Green Bay	\$4,000
	* Centralizing Access to Groundwater Information for Use in Comprehensive Planning	Lynn Markham, Charles Dunning Gregory	UW-Stevens Point & USGS	\$23,349
	* Disinfection of Enteric Viruses in Wisconsin Municipal Groundwater Systems	Harrington, Mark Borchardt and Randall Hunt and Mark Borchardt	UW-Madison, Marshfield Clinic USGS, Marshfield Clinic	\$13,385 \$32,485
	* Evaluating drinking-well vulnerability to viruses			
	* A Survey of Baseflow for Groundwater Protection Areas of the Western Fox-Wolf Watershed	G. Kraft	UW-Stevens Point	\$29,138
	* Groundwater Mounding and Contaminant Transport Beneath Stormwater Infiltration Basins	Anita Thompson Pedersen, McMahon, Kluender	UW-Madison	\$31,859
	Use of Human and Bovine Adenovirus for Fecal Source Tracking			\$41,262
	Mineral transformation and release of arsenic to solution under the oxidizing conditions of well disinfection	Gotkowitz, Roden, Schreiber, Shelobolina		\$32,137
	Groundwater recharge through a thick sequence of fine-grained sediment in the Fox River Valley, east-central Wisconsin	Hooyer, Hart, Bradbury, Mickelson		\$37,997
	Precambrian Basement Surface Estimation using Coupled 3D Modeling of Gravity and Aeromagnetic Data in Fond du Lac County and Southeastern, Wisconsin	Skalbeck		\$14,601
	Knowledge Development for Groundwater Withdrawal Management around the Little Plover River	Clancy and Kraft		\$55,093
<i>The total cost for all projects funded by DNR through the FY 07 solicitation for proposals is \$321,242.</i>				

Table 2 (cont.): Groundwater Research and Monitoring Projects to be funded in FY 07

<i>Agency</i>	<i>Title</i>	<i>Author(s)</i>	<i>Affiliation</i>	<i>Cost</i>
UWS	*Arsenic Species (III,V) Distribution in Wisconsin Groundwaters: Field Measurements and Prediction Using Multivariate Analysis of Geochemical Data	Shafer, Ellickson, Schauer	UW-MSN	\$28,666
	*Validation of Transport of VOCs from Composite Liners	Edil, Benson, Carlson	UW-MSN	\$34,868
	* Nitrate and Pesticide Penetration into a Northern Mississippi Valley Loess Hills Aquifer	Kraft, Browne	UW-STP	\$31,784
	*Climate signals in groundwater and surface water system: Spectral analysis of hydrologic processes	Bravo	UW-MKE	\$35,195
	*Transient functioning of a groundwater wetland complex, Allequash basin, Wisconsin	Anderson	UW-MSN	\$32,772
	* Assessing the Ecological Status and Vulnerability of Springs in Wisconsin (Madison Share, Beloit on USGS 104B)	Zaber, Swanson, Bradbury, Hart	UW-MSN	\$14,143
	*Measuring and Modeling Macroporous Soil Water and Solute Flux Below the Root Zone of a Plano Silt-Loam Soil (on USGS 104B)	Lowery, Norman, Lepore	UW-MSN	\$0
	Enhanced Reductive Dechlorination of Chlorinated Aliphatic Hydrocarbons: Molecular and Biochemical Analyses	W. Hickey and F. Payne	UW-MSN with USGS	\$35,670
	Application of LSQR to Calibration of a Regional MODFLOW Model: Trout Lake Basin, Wisconsin	M.P. Anderson and H. Zhang	UW-MSN with USGS	\$32,927
	Multi-Parameter, Remote Groundwater Monitoring with Referencing Using Crossed Optical Fiber Fluorescent Sensor Arrays	P. Geissinger	UW-MKE	\$6,855

The total cost for all projects to be funded by the UWS through the FY 07 joint solicitation for proposals is \$252,880.

The total cost for all projects to be funded by DNR and UWS in FY 07 is \$574,122.

* denotes continuing project from FY 06

Table 3: Groundwater Research and Monitoring Projects Funded from FY 1999 through FY 2006

Fiscal Year	Total		DNR		UWS		DATCP		Commerce	
	#	\$	#	\$	#	\$	#	\$	#	\$
<u>New projects</u>										
1999	16	438,689	5	186,766	8	160,333	4	91,590	0	0
2000	14	327,338	6	115,321	9	196,266	1	15,751	0	0
2001	19	¹ 578,895	8	276,090	7	165,924	4	78,881	1	58,000
2002	21	626,068	9	281,259	10	252,619	3	92,190	0	0
2003	7	180,621	2	17,864	6	162,757	0	0	0	0
2004	13	347,835	4	124,495	9	251,423	0	0	0	0
2005	8	130,502	0	0	8	130,502	0	0	0	0
2006	18	482,471	9	246,363	9	236,108	0	0	0	0
<u>Continuing Projects</u>										
1999	8	237,900	3	102,360	5	121,647	1	13,893	0	0
2000	11	321,171	5	186,221	4	87,000	2	47,950	0	0
2001	8	179,441	2	60,623	7	² 118,818	0	0	0	0
2002	11	234,913	5	155,026	4	² 37,077	3	42,810	0	0
2003	13	311,237	4	110,198	7	² 121,039	3	80,000	0	0
2004	3	15,170	0	0	3	² 15,170	0	0	0	0
2005	9	256,280	3	92,580	6	² 163,700	0	0	0	0
2006	4	43,485	0	0	4	43,485	0	0	0	0
<u>All Projects</u>										
1999	24	676,589	8	289,126	13	281,980	5	105,483	0	0
2000	25	648,509	11	301,542	13	283,266	3	63,701	0	0
2001	27	758,336	10	336,713	14	284,742	4	78,881	1	58,000
2002	32	860,981	14	436,285	14	289,696	6	135,000	0	0
2003	20	491,858	6	128,062	13	283,796	3	80,000	0	0
2004	16	391,088	4	124,495	12	266,593	0	0	0	0
2005	17	386,782	3	92,580	14	294,202	0	0	0	0
2006	22	525,956	9	246,363	13	279,593	0	0	0	0

¹2001 DNR figures do not include 71K from Federal 106 funds applied toward FY02 projects²2001-2006 UWS figures do not include matching USGS funds (approximately 46K per year)